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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,890	05/25/2006	Sun Yang Kook	LPP20081318US	7135

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EXAMINER	
ENIN-OKUT, EDUE	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/580,890	YANG KOOK ET AL.	
	Examiner	Art Unit	
	Edu E. Enin-Okut	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/24/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

CATHODE ACTIVE MATERIAL FOR LITHIUM SECONDARY BATTERY, PROCESS FOR PREPARING THE SAME AND REACTOR FOR USE IN THE SAME PROCESS

Detailed Action

1. The amendment filed April 12, 2010 has been entered. Applicant has amended claim 1. Claims 1-6 are pending.

Information Disclosure Statement

2. As discussed in the previous Office Action and re-iterated here, the listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Objections

3. Claim 1 is objected to because of the following informalities: The claim recites "... a plat panel ...". It appears that this phrase should be -- … a ***flat*** panel ... --. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohzuku et al. (US 2003/0170540). Additional supporting evidence provided by the Collins English Dictionary and Chambers 21st Century Dictionary.

Regarding claim 1, Ohzuku et al. teaches a process for preparing a positive electrode active material for a lithium secondary battery (paragraphs 138, 211, and 212) using a positive electrode active

material of $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ (paragraph 212; table 5), which meets Applicant's formula $Li_{1+\delta}[Ni_xMn_{x+y}Co_{1-2(x+y)}M_y]O_{2-a}P_a$ (δ=0, x=1/3, y=0, z=0, and a=0), comprising the steps of: simultaneously, adding nickel sulfate, manganese sulfate and cobalt sulfate (Applicant's metal precursors), an aqueous ammonia solution and a NaOH basic solution to a reaction bath (6) of the apparatus (Applicant's reactor) and mixing and precipitating them to obtain a nickel manganese cobalt composite hydroxide as a precursor, wherein the apparatus (Applicant's reactor) has a structure in which an agitator with vanes (Applicant's rotary vanes), which agitate, thus direct the liquid and baffles directing the aqueous solution out of the apparatus (Applicant's reactor) opening are spaced apart from the inner wall of the apparatus (Applicant's reactor); and mixing and reacting the nickel manganese cobalt composite hydroxide with lithium hydroxide (Applicant's lithium precursor) to obtain $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ (Applicant's lithium metal composite oxide) (figures 1 and 4; paragraphs 1, 85-88, 96-103, 138, 211, 212; table 5; see annotated Figs. 1 and 4 below), but does not expressly teach the rotary vanes being the reverse vane type; or, that the baffles have a shape of a flat panel and are connected to the inner wall via connecting rods.

As to the baffles having a flat panel shape, the Collins English Dictionary (Collins English Dictionary, 2000, [online]; see http://www.credoreference.com/entry/hcengdict/vane), evidences that a vane is any flat or shaped plate used to direct fluid flow (vane entry). Further, the Chambers 21st Century Dictionary (2001, [online]; see http://www.credoreference.com/entry/chambdict/baffle) evidences that a baffle is a device for controlling the flow of liquid through an opening (baffle entry).

As to the baffles being connected to the inner wall via connecting rods, it should be noted that the courts have been held that, to be entitled to weight in method claims, the recited structure limitations therein must affect the method in a manipulative sense, and not to amount to the mere claiming of a use of a particular structure. *Ex parte Pfeiffer*, 135 USPQ 31 (BPAI 1961). Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to attach the baffles to the inner

walls of the reactor, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). See MPEP 2144.04 (VI).

Ohzuku et al. also teaches that there are two experimental apparatus' (Applicant's reactors) the one shown in figure 4 and the one shown in figure 1; the agitator (3) with vanes (Applicant's rotary vanes) of figure 1 causes the flow to be downward; while the agitator with vanes (Applicant's rotary vanes) of figure 4 causes the flow to be upward (figures 1 and 4; paragraphs 85-88 and 96-103). Thus, one of these agitators with vanes (Applicant's rotary vanes) is in reverse from the other.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize either experimental apparatus (Applicant's reactors), one having a reverse type agitators with vanes (Applicant's rotary vanes) from the other, because Ohzuku et al. discloses that both of these are used to produce positive active materials by the coprecipitation method (figures 1 and 4; paragraphs 85-88 and 96-103; see annotated figures 1 and 4 below).

F I G. 1 (annotated)

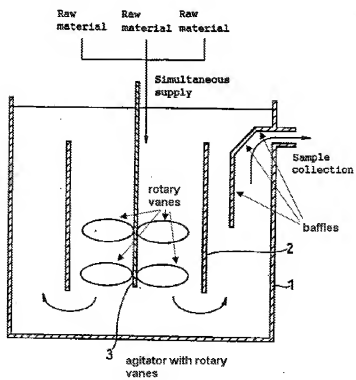
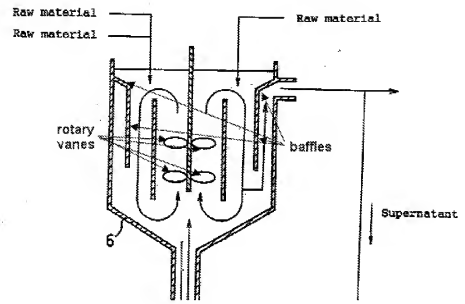


FIG. 4 (annotated)



Regarding claim 2, Ohzuku et al. teaches the aqueous solution containing nickel sulfate, manganese sulfate and cobalt sulfate, which is three metal salts being used as the metal precursor (paragraphs 211-212).

5. Claims 3, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohzuku et al. as applied to claims 1 and 2 above, and further in view of Tanigawa et al. (US 2002/0164527).

Regarding claim 3, Ohzuku et al. teaches the concentration for the aqueous ammonia solution is 4.8 mol/liter, the concentration of the aqueous nickel sulfate is 1.2 mol/liter, the concentration of the aqueous manganese sulfate is 1.2 mol/liter, and the concentration of the aqueous cobalt sulfate is 1.2 mol/liter (paragraph 211), but does not expressly teach that the concentration of the aqueous ammonia solution is between 0.2 and 0.3 of the aqueous metal solution.

Tanigawa et al. teaches a process for making a positive electrode active material with precipitation of a nickel hydroxide powder from an aqueous solution containing nickel ion and at least an

ion of Co or Mn, and that it is possible to manipulate the composition, particle circularity, particle size, specific surface are and crystallinity of the obtained active material by managing and controlling the concentration, pH, and retention time of the aqueous solution in the reaction vessel (paragraph 58-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary concentration of the aqueous solution in the reaction vessel, because Tanigawa et al. teaches that by managing and controlling the concentration of the aqueous solution in the reaction vessel it is possible to manipulate the composition, particle circularity, particle size, specific surface are and crystallinity of the obtained active material (paragraph 58-61). Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 4, Ohzuku et al. teaches the aqueous solution containing nickel sulfate, manganese sulfate and cobalt sulfate (Applicant's metal precursor) being fed into the apparatus (Applicant's reactor) at a rate of 0.5 milliliter/minute (paragraph 211), but does not expressly teach the retention time in the apparatus (Applicant's reactor).

Tanigawa et al. teaches a process for making a positive electrode active material with precipitation of a nickel hydroxide powder from an aqueous solution containing nickel ion and at least an ion of Co or Mn, and that it is possible to manipulate the composition, particle circularity, particle size, specific surface are and crystallinity of the obtained active material by managing and controlling the concentration, pH, and retention time of the aqueous solution in the reaction vessel (paragraph 58-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the retention time of the aqueous solution in the reaction vessel, because Tanigawa et al. teaches that by managing and controlling the retention time of the aqueous solution in the reaction vessel it is possible to manipulate the composition, particle circularity, particle size, specific surface are and crystallinity of the obtained active material (paragraph 58-61). Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 5, Ohzuku et al. teaches 4.8 mol/liter of aqueous NaOH (Applicant's basic solution) being added to the apparatus (Applicant's reactor) (paragraph 211), but does not expressly teach the aqueous NaOH (Applicant's basic solution) being added to make a pH of 11.0 to 11.5.

Tanigawa et al. teaches a process for making a positive electrode active material with precipitation of a nickel hydroxide powder from an aqueous solution containing nickel ion and at least an ion of Co or Mn, and that it is possible to manipulate the composition, particle circularity, particle size, specific surface are and crystallinity of the obtained active material by managing and controlling the concentration, pH, and retention time of the aqueous solution in the reaction vessel (paragraph 58-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the pH of the aqueous solution in the reaction vessel, because Tanigawa et al. teaches that by managing and controlling the pH of the aqueous solution in the reaction vessel it is possible to manipulate the composition, particle circularity, particle size, specific surface are and crystallinity of the obtained active material (paragraph 58-61). Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohzuku et al. in view of Tanigawa et al. as applied to claims 1-5 above, and further in view of Sun et al. (US 6,071,489).

Ohzuku et al. teaches mixing and reacting the nickel manganese cobalt composite hydroxide with lithium hydroxide (Applicant's lithium precursor) to obtain $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ (Applicant's lithium metal composite oxide) (paragraphs 211 and 212), but is does not expressly teach a chelating agent being used in the step of obtaining the lithium metal composite oxide.

Sun et al. teaches glycolic acid being used as a chelating agent in the step of preparing the lithium cathode active material, so that a pure phase of lithium cathode active material powder is prepared (column 12, lines 29-35). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to utilize glycolic acid as a chelating agent in the step of forming the lithium positive electrode active material, which is the lithium metal composite oxide, because Sun et al. teaches glycolic acid being used as a chelating agent in the step of preparing the lithium cathode active material, so that a pure phase of lithium cathode active material powder is prepared (column 12, lines 29-35).

Response to Arguments

7. As to the applicant's arguments with respect to Ohzuku reference (see p. 4-5 of its remarks), applicant argues that the following:

> "... Examiner has corresponded a guide for sample collection of Ohzuku et al. to the baffle of Claim 1. However, the guide for sample collection should be continuously extended from the inner wall of the reactor to guide flow of sample to the outlet. Accordingly, the guide for sample collection cannot have separated plural parts and cannot be attached to the inner wall by connecting rods. ..."

However, as shown in the annotated Fig. 4 from the Ohzuku reference, the baffle on the left side of the reactor is not involved in the movement of a sample from the reactor; and, the baffle on the right side of the reactor also facilitates moving a sample from the reactor (i.e., it appears that this baffle serves more than one purpose). As to applicant's remarks with respect to a "sample guide" as discussed above, the courts have held that the arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). There does not appear to any support in the Ohzuku reference that applicant's contentions regarding a "sample guide" are applicable to it.

8. As to the remainder or Applicant's arguments with respect to claims 1-6, filed on April 12, 2010, they have been considered, but applicant has amended the claims such that new grounds of rejection were necessitated.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday to Thursday, 7 a.m. - 3 p.m. (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E. Enin-Okut/
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795